IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A current-perpendicular-to-plane (CPP) GMR/tunnel valve (TV) sensor, comprising:

a sensor stack having a free layer forming an active area;

a spacer layer formed over a top surface of the free layer of the sensor stack;

a biasing layer disposed ~~over~~ on and in contact with a top surface of the spacer; and

a high coercivity layer formed without contact with the biasing layer and adjacent the sensor stack for pinning the biasing layer, the biasing layer maintaining a direction of magnetization in the free layer until influenced by a readback field.

2. (Original) The CPP GMR/ TV sensor of claim 1, wherein the high coercivity layer comprises an alpha-Fe_2O_3 layer.

3. (Original) The CPP GMR/ TV sensor of claim 1 further comprising a seed layer disposed over the high coercivity layer and a coupling layer disposed over the bias layer and the seed layer.

4. (Original) The CPP GMR/ TV sensor of claim 3, wherein the seed layer comprises a NiFe seed layer, the high coercivity layer comprises an alpha-Fe_2O_3 layer formed adjacent the sensor stack in a passive area and the coupling layer comprises NiFe layer.

5. (Original) The CPP GMR/ TV sensor of claim 1, wherein the sensor stack comprises a pinned layer, a spacer layer and the free layer.

6. (Original) The CPP GMR/ TV sensor of claim 5, wherein the pinned layer comprises a first CoFe layer, a Ru layer and a second CoFe layer.

7. (Currently Amended) The CPP GMR/ TV sensor of claim 5, wherein the free layer comprises an ~~a CoFe/NiFe~~ alloy layer comprising CoFe and NiFe.

8. (Original) The CPP GMR/ TV sensor of claim 5, wherein the sensor stack further comprises a sensor stack seed layer, the pinned layer being formed on the seed layer.

9. (Original) The CPP GMR/ TV sensor of claim 8, wherein the sensor stack seed layer comprises a NiFeCr layer, a NiFe layer and a PtMn layer.

10. (Currently Amended) The CPP GMR/ TV sensor of claim 1, wherein the bias layer is pinned ~~attains pinning~~ by exchange coupling between the bias layer ~~in the active area and passive areas~~ and the high coercivity layer.

11. (Currently Amended) A magnetic storage system, comprising:

a magnetic storage medium having a plurality of tracks for recording of data; and

a CPP GMR/ TV sensor maintained in a closely spaced position relative to the magnetic storage medium during relative motion between the magnetic transducer and the magnetic storage medium, the CPP GMR/ TV sensor further comprising:

a sensor stack having a free layer forming an active area;

a spacer layer formed over a top surface of the free layer of the sensor stack;

a biasing layer disposed ~~over~~ on and in contact with a top surface of the spacer; and

a high coercivity layer formed without contact with the biasing layer and adjacent the sensor stack for pinning the biasing layer, the biasing layer maintaining a direction of magnetization in the free layer until influenced by a readback field.

12. (Original) The CPP GMR/ TV sensor of claim 11, wherein the high coercivity layer comprises an alpha-Fe_2O_3 layer.

13. (Original) The CPP GMR/ TV sensor of claim 11 further comprising a seed layer disposed over the high coercivity layer and a coupling layer disposed over the bias layer and the seed layer.

14. (Original) The CPP GMR/ TV sensor of claim 13, wherein the seed layer comprises a NiFe seed layer, the high coercivity layer comprises an alpha-Fe_2O_3 layer formed adjacent the sensor stack in a passive area and the coupling layer comprises NiFe layer.

15. (Original) The CPP GMR/ TV sensor of claim 11, wherein the sensor stack comprises a pinned layer, a spacer layer and the free layer.

16. (Original) The CPP GMR/ TV sensor of claim 15, wherein the pinned layer comprises a first CoFe layer, a Ru layer and a second CoFe layer.

17. (Currently Amended) The CPP GMR/ TV sensor of claim 15, wherein the free layer comprises an ~~a CoFe/NiFe~~ alloy layer comprising CoFe and NiFe.

18. (Original) The CPP GMR/ TV sensor of claim 15, wherein the sensor stack further comprises a sensor stack seed layer, the pinned layer being formed on the seed layer.

19. (Original) The CPP GMR/ TV sensor of claim 18, wherein the sensor stack seed layer comprises a NiFeCr layer, a NiFe layer and a PtMn layer.

20. (Currently Amended) The CPP GMR/ TV sensor of claim 11, wherein the bias layer is pinned ~~attains pinning~~ by exchange coupling between the bias layer ~~in the active area and passive areas~~ and the high coercivity layer.

21. (Original) A method for reducing the thickness of a sensor stack in a current-perpendicular-to-plane (CPP) GMR/tunnel valve (TV) sensor, comprising:

forming a sensor stack seed layer;

forming, over the sensor stack seed layer, a sensor stack having a free layer, a spacer and a pinned layer;

forming a spacer layer over the free layer of the sensor stack;

forming a biasing layer over the spacer; and

adjacent to the sensor stack, forming a high coercivity layer for pinning the bias layer;

forming a passive area seed layer over the high coercivity layer;

forming a layer of Ta over the bias layer and the passive area seed layer;

removing the Ta layer even with the bias layer;

forming, over the bias layer and the passive area seed layer, a coupling layer for pinning the biasing layer, the biasing layer maintaining a direction of magnetization in the free layer until influenced by a readback field; and

forming a cap over the coupling layer.